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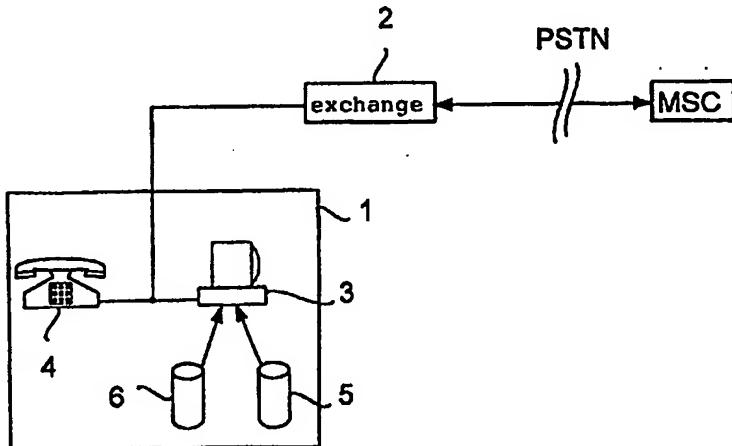


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(21) International Application Number: PCT/FI96/00264	(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).
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(71) Applicant (<i>for all designated States except US</i>): TELECOM FINLAND OY [FI/FI]; Sturenkatu 16, P.O. Box 106, FIN-00051 Tele (FI).	
(72) Inventors; and	Published
(75) Inventors/Applicants (<i>for US only</i>): SIMOLA, Olli [FI/FI]; Vuorenpeikontie 3 a 48, FIN-00820 Helsinki (FI). SANDMAN, Tom [FI/FI]; Lokitie 44 C, FIN-00980 Helsinki (FI).	With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments. <i>In English translation (filed in Finnish).</i>
(74) Agent: LAHTI, Heikki; Telecom Finland Oy, P.O. Box 106, FIN-00051 Tele (FI).	

(54) Title: METHOD FOR GUIDING A USER OF A MOBILE STATION OF A CELLULAR RADIO SYSTEM BOTH A SERVICE CENTRE OF A TELECOMMUNICATIONS SYSTEM



(57) Abstract

This invention relates to a method for guidance of a mobile station user of a cellular radio system. In order to make it possible to guide the mobile station user regardless the fact, whether he himself knows his location, a service request transmitted from the mobile station is received as also the cell identification of the mobile station, which has transmitted the service request from the cellular radio system (MSC), a chart is searched based on the cell identification received to the display device (3), whereby this chart covers the geographical area, in which the mobile station is situated, and the mobile station user is guided on the grounds of the searched chart according to the service request transmitted from the mobile station. The invention is related also to a service center (1).

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Method for guiding a user of a mobile station of a cellular radio system both a service centre of a telecommunications system

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The invention relates to a method for guiding the user of a mobile station of the cellular radio system. The invention relates also to a service centre of a telecommunications system, comprising means for establishing a connection 10 to the mobile station of the cellular radio system as a response to the service request transmitted from the mobile station.

When travelling in an unfamiliar area, for instance in scattered settlement regions, it is often difficult because of the lack of local knowledge to find certain objects, for instance the service points located nearby. The situation becomes very problematic for instance in the case, when the service points are not located along the main road, but in small villages, past which the main road has been directed, or when even a chart is not available. In such cases it may sometimes be very difficult to find out for example a service station to get fuel replenishment. A chart carried with naturally makes the situation a bit easier, but even 25 then an own location may be unclear and hence a problem. If own location is not clear, even portable mobile phone offers no substantial advantage after fuel has ended, because it is not possible to get the road service or corresponding unit to the site because of insufficient location knowledge, though the phone number of the road service unit is 30 known.

The object of this invention is to solve the above-mentioned problem and provide a method for guiding the user of a mobile station regardless the fact, whether he himself knows his location. This object is attained by the method 5 according to the invention, which is characterized in that a service request is received from the mobile station, a cell identification of the mobile station that transmitted the service request is received from the cellular radio system, whereby based on the cell identification received 10 to the display device a chart is searched for, covering the geographical area, in which the mobile station is located, and the user of the mobile station is guided by this chart according to the service request transmitted via mobile station.

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A further object of the invention includes a service centre of a telecommunications system, which can be utilized for the realization of the method according to the invention. The service centre according to the invention is characterized in that it comprises means for reception of the cell identification of the mobile station and for the presentation of a chart corresponding the cell identification as a response to the reception of the cell identification, whereby this chart covers the geographical area, where the 20 mobile station is located.

The invention is based on the idea, that when the cell identification receivable for the cell radio system is utilized to open a chart to the terminal screen, so that this 30 chart covers the radio cell and its environment, where the mobile station is situated, the location of the mobile

phone can be found and guidance can be given to the user of the phone according to the wishes of the user. Accuracy, by which the mobile station can be located, depends naturally on the size of the radio cells of the cellular radio system

5 under operation. The location of the mobile station can typically be defined in population centres with the accuracy of about three kilometres and outside the population centres with the accuracy of about fifteen kilometres.

10 The guidance offered to user may include for instance the advice the operator of the service centre gives to him concerning the direction, to which the user of the mobile station user should go in order to reach the nearest gas station, where he can buy fuel. The operator of the service

15 centre may alternatively inform the stray user of the mobile phone his location, whereafter the mobile phone user can by the chart carried by him find his location and the route from his location point to the desired place. The most substantial advantages of the method and the service

20 centre according to the invention include therefore, that the user of the mobile phone can be guided regardless the fact, whether the user initially knows his own location, that the operator of the service centre can guide the user of the mobile phone, though he himself has no local knowledge of the area, where the mobile phone is situated, because the information needed for the guidance is found in the chart to be opened by the cell code of the service centre, and that the invention can be utilized in connection with already existing cellular radio systems, so that the

25 costs needed for the realization of the method according to the invention will be relatively low.

Preferable realization forms of the method and the service centre according to the invention are shown in the accompanying dependent claims 2 and 4 - 6.

- 5 The invention will be described in the following in detail as an example by a preferred embodiment of a service centre according to the invention with reference to the enclosed drawing, in which:
- 10 Figure 1 shows a block diagram of a part of the GSM-cellular radio system;

Figure 2 illustrates the first preferable embodiment of the service centre according to the invention.

- 15
- Figure 1 shows a block diagram of a part of the GSM-cellular radio system. In Fig. 1 it has been presented six base stations BTS1 - BTS6 (Base Transceiver Stations), which all cover certain geographical area. Base stations
- 20 BTS1 - BTS6 have been connected via a Base Station Controller BSC to the Mobile Services Switching Centre MSC, which in its part is connected with the public switched telephone network.
- 25 The geographical area covered by individual base stations may be divided into several sectors or radio cells as in the case of the base station BTS6. The area covered by the base station BTS6 has been divided into three radio cells A, B and C, whereby in the case of Fig. 1 a mobile phone is
- 30 placed to the radio cell A. The mobile phone centre MSC maintains the information known per se of the mobile phones

locating in the geographical area covered by it, so that incoming calls could be directed to the mobile phones in question.

5 Cell identifications of mobile stations of a cellular radio system are transmitted for instance in the additional information field of the TUP-93 signalling call formation message or in a corresponding way, if in the system it is used something else than the TUP-93 signalling. The additional information field is included in the specification of the TUP-93 signalling. The contents of the additional information field include the cell identification described in the specifications of the cellular radio system concerned, which for instance for the GSM-system has been presented in the specifications GSM 08.08 (§3.2.2.17) and GSM 04.08 (§10.5.1.1 and §10.5.1.3). TUP-93 signalling has been described for instance in the publication "Kansallinen yhteiskanavamerkinantojärjestelmä, puhelinkäyttäjäosa TUP" (National Common-Channel Signalling System, telephone user part TUP), Telecom Finland Oy and Puhelinlaitosten Liitto (Association of Telephone Companies), Helsinki 1994, which is hereby included in this application as reference.

In the case of Fig. 1 for instance to the mobile phone centre MSC is therefore transmitted during the speech formation an information message, indicating that the mobile phone MS or the mobile phone's MS cell identification is situated in the cell A of the base station BTS6.

30 The GSM-system has been described in detail for instance in the book "The GSM Systems for Mobile Communications", M.

Mouly and M-B. Pautet, Palaiseau, France, 1992, ISBN:2-9507190-0-7, wherefore it is not described more closely in this connection.

5 Fig. 2 illustrates the first preferable embodiment of the service centre according to the invention. When a call is made by the mobile phone MS according to Fig. 1 to the service number of the service centre 1, the cell identification of the mobile phone MS is hereby transmitted to the
10 mobile phone centre MSC. The mobile phone centre MSC transmits in its part the cell identification in question further to the public switched telephone network PSTN, through which it is sent unchanged to the local centre 2 according to Fig. 2. In this exemplary case the transmission of the
15 cell identification via the telephone network requires that in all the connections between the centres, through which the call goes, TUP-93 signalling will be used.

The connection between the telephone exchange 2 and the
20 service centre's work station (e.g. ISDN) has been realized so, that the cell identification can be transferred to the terminal 3. When a call comes to the service centre 1, a chart realization is activated from the operators data terminal 3, seeking the cell identification from the terminal's CTI-interface (Computer Telephone Integration). On the grounds of the received cell identification the terminal 3 searches from the memory means 5 the chart corresponding the cell identification concerned and recorded in digital form and opens this chart to the terminal display screen. The memory means 5 may consist for instance of
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a data set in the computer's hard disk or alternatively for example a CD-ROM disk.

Via the telephone 4 the operator can thereafter ask the 5 user of the mobile station to describe the type of information he needs. If the user has gone astray, the operator may advise to which direction the mobile station user should go to reach the desired place.

10 If the mobile station user on the other hand needs information for example of the gas stations located nearby, the operator may search proper information to his display screen from the memory means 6. In the memory means 6, which may comprise for instance a file in the computer's 15 hard disk, it is maintained information about the service providers situated in the area covered by certain radio cell. The operator can then, using the cell identification transmitted from the telephone network, search data concerning the gas stations located near the mobile station 20 user. To the memory means 6 has been advantageously deposited information concerning among other things addresses, business hours, available services and telephone numbers of the nearby situated gas stations. If the mobile station user so desires, the operator may switch the user's call to 25 the gas station he prefers.

It is to be understood, that the above description and the figures associated with it have the purpose only to illustrate the present invention. It is obvious to a person skilled in the art that different variations and modifications can be made to the invention without deviating from 30

**the spirit and scope thereof defined in the accompanying
claims.**

Claims:

1. Method for guiding a user of a mobile station (MS) of a cellular radio system, characterized in that:

5 a service request transmitted through the mobile station (MS) is received,

a cell identification of the mobile station, which has transmitted the service request from the cellular radio system, is received,

10 on the grounds of the cell identification received to the display device (3) a chart is searched, covering the geographical area, in which the mobile station is situated, the mobile station user is guided based on the searched chart according to the service request transmitted 15 from the mobile station.

2. Method according to claim 1, characterized in that the guidance of the mobile station comprises data transmission to the mobile station user concerning the direction, 20 to which the user should go in order to reach the desired place.

3. Service centre (1) of a telecommunications system, comprising means (4) to establish a connection to a mobile station (MS) in a cellular radio system as the response to 25 a service request transmitted from the mobile station, characterized in that the service centre (1) comprises means (3,5) for reception of the cell identification of the mobile station (MS), and for presentation of the chart corresponding to the cell identification as the response to the 30 reception of the cell identification, whereby said chart

covers the geographical area, in which the mobile station (MS) is located.

4. Service centre by claim 3, characterized in that the
5 service centre (1) comprises further means (6) to present information concerning the service providers located in the geographical area covered by the chart presented by the display device (3).

10 5. Service centre according to claim 4, characterized in that the service centre (1) comprises further means (3) to establish a connection between the service provider located in the area covered by the chart and the mobile station (MS), according to the mobile station user.

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6. Service centre according to any of the preceding claims 3 - 5, characterized in that said telecommunications system comprises a public switched telephone network (PSTN), and that the service centre (1) has been connected
20 via ISDN-connection to the local centre (2) of the telephone network adapted to receive the cell identification from the telephone network and to transfer it further to the service centre (1) in the additional information field of the call formation message according to the TUP-93 signalling.
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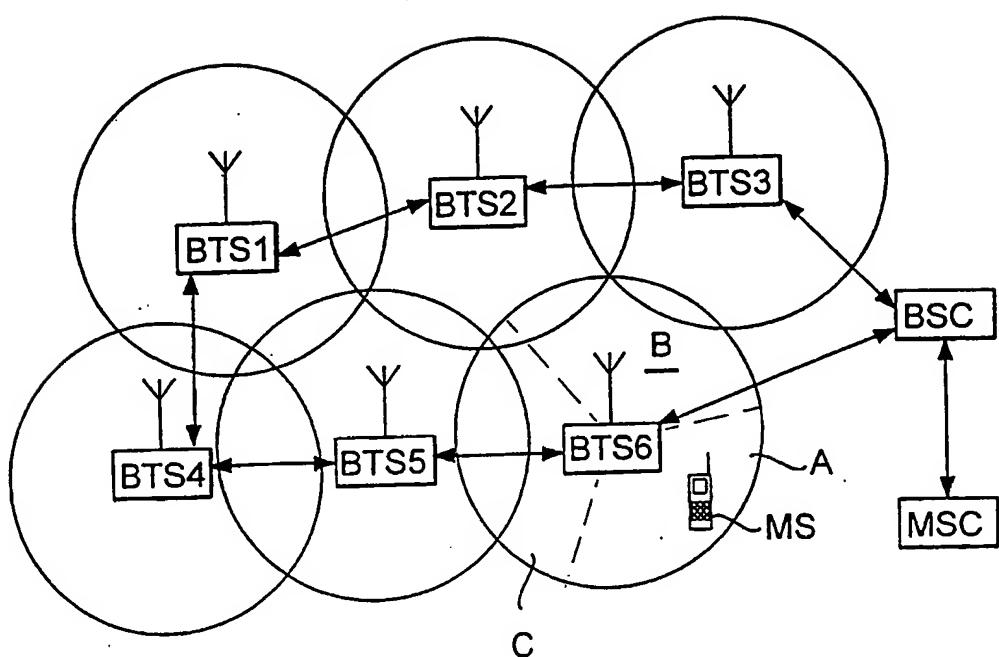


FIG. 1

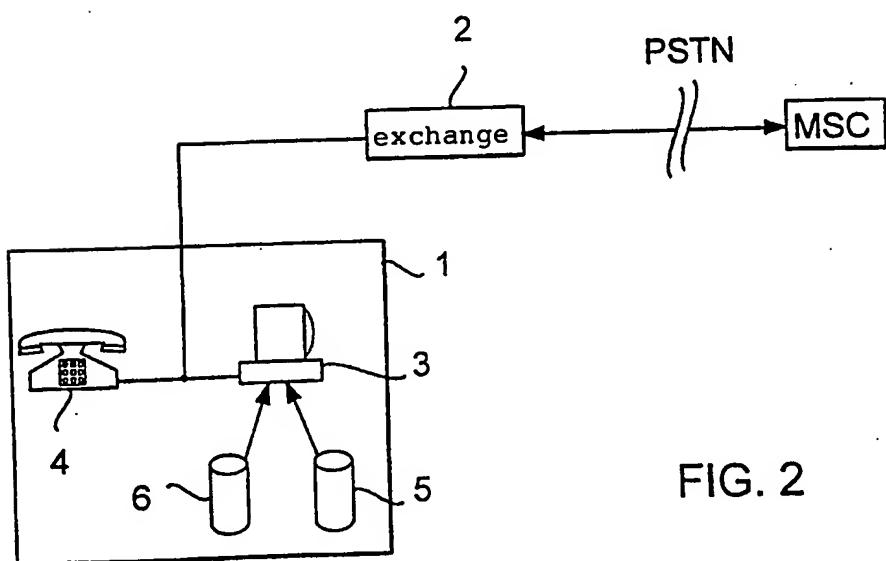


FIG. 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI 96/00264

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04Q 7/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5208756 A (H.L. SONG), 4 May 1993 (04.05.93), column 4, line 33 - line 47, abstract --	1-4
X	WO 9406221 A1 (SUSUMU SAKUMA), 17 March 1994 (17.03.94), abstract --	1-4
A	US 5003317 A (D.R. GRAY ET AL), 26 March 1991 (26.03.91), column 1, line 55 - column 2, line 26 --	1-6
P,A	US 5428546 A (M.C. SHAH ET AL), 27 June 1995 (27.06.95), column 2, line 59 - column 4, line 2 -----	1-6

Further documents are listed in the continuation of Box C.

See patent family annex.

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Date of the actual completion of the international search

11 Sept 1996

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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US-A- 5208756	04/05/93	AU-A-	1343692	27/08/92
		WO-A-	9213284	06/08/92
WO-A1- 9406221	17/03/94	AU-A-	4981993	29/03/94
		JP-A-	6252832	09/09/94
		KR-B-	9600930	15/01/96
		JP-A-	6085736	25/03/94
		CN-A-	1089035	06/07/94
		JP-A-	6164475	10/06/94
US-A- 5003317	26/03/91	NONE		
US-A- 5428546	27/06/95	AU-B-	657604	16/03/95
		AU-A-	2174895	31/08/95
		AU-A-	2852495	09/11/95
		AU-A-	3378493	28/04/94